

REMARKS

Entry of the foregoing, reexamination and further and favorable reconsideration of the subject application in light of the following remarks, pursuant to and consistent with 37 C.F.R. § 1.112, are respectfully requested.

Status

As is correctly indicated in the Office Action Summary, Claims 1, 2, 5, and 7-21 are pending. Claims 1-2 and 7-18 have been withdrawn from consideration. Claims 5 and 19-21 stand rejected.

Priority Document

Enclosed herewith is a certified copy of Japanese Application No. 2000-172850, from which this application claims priority. Acknowledgment of receipt of this certified copy is respectfully requested.

Interview

Applicants wish to thank Examiner Collins and Supervisor Nelson for the courtesies extended to the undersigned during the personal interview ("Interview") conducted on December 3, 2003. During the Interview, the pending claims, possible claim amendments, and the cited Bunkelmann publication were discussed.

Summary of Amendments

By the foregoing amendments, Claims 1-4 and 6-18 have been canceled without prejudice or disclaimer to pursuing that subject matter in one or more continuing applications.

Also by the foregoing amendments, Claims 5 and 19 were amended so as to delete the phrase "stringent conditions" and so as to add specific hybridization conditions in part (c), as well as functional language, as recommended at the Interview. Support for the hybridization language amendments may be found at least at Pages 9-10, Paragraph 0021, of the Specification. Support for the functional language amendments may be found throughout the Specification, and at least at Page 5, Paragraph 0012, of the Specification. Accordingly, no new matter has been added.

Also by the foregoing amendments, Claim 20 was amended to delete "exhibits 90% homology" and to add "exhibits at least 95% homology." Support for this amendment may be found at least at Pages 6-7, Paragraph 0015, of the Specification. As explained in Paragraph 0015, Applicants' invention includes an amino acid sequence in which a part of SEQ ID NO:1 has been deleted, substituted or added. *See Page 7, Paragraph 0015, Lines 1-3.* This includes "a polypeptide in which 20 or less . . . amino acids of the sequence is deleted, substituted or added to the amino acid sequence shown in SEQ ID NO:1." *Id. at Lines 4-6.* If one deletes or substitutes 15 amino acids $((276 \div 291) \times 100)$, 94.8% or 95% homology results. Accordingly, no new matter has been added.

Finally by the foregoing amendments, Claim 21 was amended to deleted "exhibits 90% homology" and to add "exhibits at least 98% homology." Support for this amendment may be found at least at Pages 6-7, Paragraphs 0014-0015, of the Specification. As explained in Paragraph 0014, Applicants' invention includes a nucleic acid sequence "in

which 20 or less . . . bases of the sequence is deleted, substituted or added to the base sequence shown in SEQ ID NO:2." *See Page 6, Paragraph 0014, Lines 14-16.* If one deletes or substitutes 20 nucleotides $((1069 \div 1089) \times 100)$, 98.2% or 98% homology results. Accordingly, no new matter has been added.

Rejections Under 35 U.S.C. § 112, First Paragraph — Written Description

Claims 5 and 19-21 were rejected under 35 U.S.C. § 112, First Paragraph, as purportedly lacking written description. *See Final Official Action, Pages 2-3.* These rejections are respectfully traversed.

Not to acquiesce in the Examiner's rejection, but solely to facilitate prosecution, Applicants have amended Claims 5 and 19 so as to contain specific hybridization conditions and functional language, as recommended by the Examiner at the Interview. Specifically, Claims 5 and 19 have been amended to specify that the isolated nucleic acid sequence claimed in part (c) of Claims 5 and 19 is one which hybridizes to the isolated nucleic acid sequence of part (a) at 65°C in a solution containing 6XSSC, 5X Dernhardt's solution, 0.1% SDS, and 0.1 mg/ml denatured herring sperm DNA, followed by washing at 65°C in 2XSSC, 0.1% SDS, then in 1XSSC and 0.1% SDS, and then in 0.1XSSC and 0.1SDS. As recommended by the Examiner, this language closely mirrors that found at Page 9, Paragraph 0021, of the Specification, but recites this language in a more narrative form.

In addition, Applicants have amended Claims 5 and 19 to recite functional language. Specifically, Claims 5 and 19, as amended, require that the isolated nucleic acid sequence is induced by high temperature stress, is derived from barley, and confers thermotolerance to a plant transformed therewith. Applicants believe that these amendments resolve any concern that Applicants were not in possession of the subject matter now claimed.

Applicants maintain, at least in light of the foregoing amendments to Claims 5 and 19 (and, therefore, Claims 21 and 20, which depend, respectively, on Claims 5 and 19), that the 35 U.S.C. § 112, First Paragraph, written description rejections have been rendered moot. Accordingly, Applicants respectfully request withdrawal of said rejections.

Rejections Under 35 U.S.C. § 112, First Paragraph — Enablement

Claims 5 and 19-21 were rejected under 35 U.S.C. § 112, First Paragraph, as allegedly not enabled. *See Final Official Action, Pages 3-5.* These rejections are respectfully traversed.

Not to acquiesce in the Examiner's rejection, but solely to facilitate prosecution, Applicants have amended Claims 5 and 19 so as to contain specific hybridization conditions and functional language, as recommended by the Examiner at the Interview. *See Written Description explanation provided above.* Applicants have also amended Claims 20 and 21 to require at least 95% and at least 98% homology, respectively. *See Summary of Amendments, Paragraphs 2-3, above.* "The test of enablement is not whether **any** experimentation is necessary, but whether, if experimentation is necessary, it is **undue**." *See M.P.E.P. § 2164.01* (emphasis added). Applicants maintain that, especially in light of the present amendments, one of skill in the art can readily both make and use Applicants' invention described in Claims 5 and 19-21.

For example, one of skill in the art can readily make an isolated nucleic acid sequence consisting of nucleotides 1 to 1089 of SEQ ID NO:2 as well as an isolated nucleic acid sequence wherein no more than 5 additions, deletions, or substitutions of SEQ ID NO:2 are made. Similarly, it is well within the abilities of the skilled artisan to make isolated nucleic acid sequences which hybridize to the sequence of SEQ ID NO:2 under the

now-enumerated stringency conditions. That same skilled artisan can then readily determine whether such sequences are induced by high temperature stress, derived from barley, and confer thermotolerance to a plant transformed therewith. Because such activities involve routine, and not undue, experimentation, Claims 5 and 21 do not lack enablement.

Similarly, one of skill in the art can readily make an isolated nucleic acid sequence encoding amino acids 1 to 291 of SEQ ID NO:1 as well as an isolated nucleic acid sequence wherein no more than 5 additions, deletions, or substitutions of amino acids of SEQ ID NO:1 are made. Similarly, it is well within the abilities of the skilled artisan to make isolated nucleic acid sequences which hybridize to the sequence encoding the amino acids of SEQ ID NO:1 under the now-enumerated stringency conditions. That same skilled artisan can then readily determine whether such sequences are induced by high temperature stress, derived from barley, and confer thermotolerance to a plant transformed therewith. Because such activities involve routine, and not undue, experimentation, Claims 19 and 20 do not lack enablement.

In view of the foregoing, Applicants respectfully request withdrawal of the 35 U.S.C. § 112, First Paragraph, enablement rejection of Claims 5 and 19-21.

Rejections Under 35 U.S.C. § 112, Second Paragraph — Indefiniteness

Claims 5 and 19 were rejected under 35 U.S.C. § 112, Second Paragraph, as purportedly indefinite due to the phrase "under stringent conditions." *See Final Official Action, Page 5*. This rejection is respectfully traversed.

Not to acquiesce in the Examiner's rejection, but solely to facilitate prosecution, Applicants have amended Claims 5 and 19 so as to include specific hybridization

conditions. As explained above, Claims 5 and 19 have been amended to specify that the isolated nucleic acid sequence claimed in parts (c) is one which hybridizes to the isolated nucleic acid sequence of parts (a) at 65°C in a solution containing 6XSSC, 5X Dernhardt's solution, 0.1% SDS, and 0.1 mg/ml denatured herring sperm DNA, followed by washing at 65°C in 2XSSC, 0.1% SDS, then in 1XSSC and 0.1% SDS, and then in 0.1XSSC and 0.1% SDS. As recommended by the Examiner, this language closely mirrors that found at Page 9, Paragraph 0021, of the Specification, but recites this language in a more narrative form.

Applicants believe that these amendments have rendered moot the outstanding indefiniteness rejection, and respectfully request withdrawal thereof.

Rejections Under 35 U.S.C. § 102(b) Over Bunkelmann et al.

Claims 5 and 19-21 were rejected under 35 U.S.C. § 102(b) as allegedly anticipated by GenBank Accession No. U37060 to Bunkelmann et al. ("Bunkelmann"). These rejections are respectfully traversed.

To anticipate a claim, a single source must contain all of the elements of the claim. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379 (Fed. Cir. 1986). The Examiner has stated that Bunkelmann "teach[es] an isolated nucleic acid having 72.1% sequence similarity to SEQ ID NO:2 and encoding a polypeptide having 80.4% sequence similarity to SEQ ID NO:1." *See Official Action mailed January 2, 2003, Page 9.* Part (a) of Claim 5 requires 100% similarity to nucleotides 1 to 1089 of SEQ ID NO:2. As such, Bunkelmann's mere 72.1% does not contain all limitations of part (a) and thus does not anticipate.

With respect to part (b) of Claim 5, if one were to delete or substitute no more than 5 nucleotides from SEQ ID NO:2, he would arrive at a sequence having 99.5% sequence similarity $((1084 \div 1089) \times 100)$. If one were to add no more than 5 nucleotides to SEQ ID NO:2, he would arrive at a sequence having 99.5% sequence similarity $((1089 \div 1094) \times 100)$. Because 99.5% sequence similarity greatly exceeds the 72.1% similarity of Bunkelmann, part (b) of Claim 5 has not been anticipated.

With respect to part (c) of Claim 5, the claimed sequence must hybridize to the sequence of part (a) under specific hybridization conditions. Because Bunkelmann is silent as to such conditions and because expression of the sequences of Claim 5 must be induced by high temperature stress, derived from barley, and confer thermotolerance to a plant transformed therewith, Bunkelmann again fails to anticipate Claim 5. Claim 21 depends from Claim 5, and thus contains the foregoing limitations. By extension, Bunkelmann also fails to anticipate Claim 21.

Turning now to Claim 19, part (a) requires 100% sequence similarity with SEQ ID NO:1. Because Bunkelmann has but 80.4% sequence similarity, it does not anticipate part (a). Part (b) of Claim 19 allows for no more than 5 additions, substitutions, or deletions, resulting in 98.3% sequence similarity $((286 \div 291) \times 100)$ or $((291 \div 296) \times 100)$ with SEQ ID NO:1. Because Bunkelmann has but 80.4% sequence similarity, it does not anticipate part (b). With respect to part (c) of Claim 19, the claimed sequence must hybridize to the sequence of part (a) under specific hybridization conditions. Because Bunkelmann is silent as to such conditions and because expression of the sequences of Claim 19 must be induced by high temperature stress, derived from barley, and confer thermotolerance to a plant transformed therewith, Bunkelmann again fails to anticipate

Claim 19. Claim 20 depends from Claim 19, and thus contains the foregoing limitations.

By extension, Bunkelmann also fails to anticipate Claim 20.

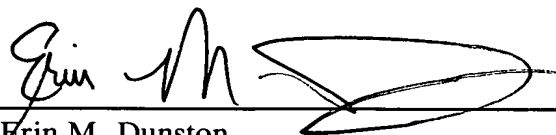
In light of the foregoing, Applicants respectfully request withdrawal of the 35
U.S.C. § 102(b) rejections of Claims 5 and 19-21 over Bunkelmann.

CONCLUSION

From the foregoing, further and favorable consideration in the form of a Notice of Allowance is respectfully requested and earnestly solicited.

In the event that there are any questions relating to this response, or the application in general, it would be greatly appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

Respectfully submitted,
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